WHAT IS CLAIMED IS:

1. A queue control device comprising:

a first storage area for storing a first and a second queue, said first queue including a plurality of elements, each of said elements having an address specifying the next element, and said second queue including a plurality of elements, each of said elements having an address specifying the next element;

a second storage area for storing first pointer information and second pointer information, said first pointer information being a head address specifying the head element in said first queue, and said second pointer information being a tail address specifying the tail element in said second queue; and

a controller which controls said first and second storage areas and which sets not only an address specifying the head element in said second queue in the tail element in said first queue stored in said first storage area but also an address specifying the tail element address in said first queue in the tail element in said second queue and controls said first and second queues according to said first pointer information and second pointer information stored in said second storage area.

2. The queue control device according to claim 1, wherein said controller, when said first queue is absent, sets not only an address specifying the head element in said second queue as said first pointer

information in said second storage area but also first information indicating that said first queue is absent in the tail element in said second queue in said first storage area.

3. The queue control device according to claim 1, wherein said controller, when said second queue is absent, sets not only an address specifying the tail element in said first queue as said second pointer information in said second storage area but also second information indicating that said second queue is absent in the tail element in said first queue in said first storage area.

4. The queue control device according to claim 1, wherein said second storage area stores a plurality of pieces of said first pointer information and a plurality of pieces of said second pointer information.

5. The queue control device according to claim 1, wherein said first queue is given higher priority than said second queue.

6. The queue control device according to claim 1, wherein said first storage area stores the number of a virtual channel according to each of said elements.

7. The queue control device according to claim 1, wherein said controller is connected to a transmission controller, said transmission controller outputting a virtual channel according to said number of a virtual channel supplied from said controller.

8. A queue control device comprising:

a first storage area for storing a plurality of queue groups, each of said queue groups including a first and a second queue, each of said first and second queues having a plurality of elements, each of said elements in said first and second queues holding an address specifying the next element;

a second storage area for storing a time table, said time table including a plurality of time entries, each of said time entries having first pointer information and second pointer information, said first pointer information being a head address specifying the head element in said first queue in each of said queue groups and said second pointer information being a tail address specifying the tail element in said second queue in each of said queue groups; and

a controller which controls said first and second storage areas and which sets not only an address specifying the head element in said second queue in the tail element in said first queue in each of said queue groups stored in said first storage area but also an address specifying the tail element in said first queue in the tail element in said second queue and controls each of said first and second queues according to said first pointer information and second pointer information.

9. The queue control device according to claim 8,

wherein said controller, when said first queue is absent in each of said queue groups, sets not only an address specifying the head element in said second queue as said first pointer information in said second storage area but also first information indicating that said first queue is absent in the tail element in said second queue in said first storage area.

10. The queue control device according to claim 8, wherein said controller, when said second queue is absent in each of said queue groups, sets not only an address specifying the tail element in said first queue as said second pointer information in said second storage area but also second information indicating that said second queue is absent in the tail element in said first queue in said first storage area.

11. The queue control device according to claim 8, wherein said first queue is given higher priority than said second queue in each of said queue groups.

12. The queue control device according to claim 8, wherein said first storage area stores the number of a virtual channel according to each of said elements in each of said queue groups.

13. The queue control device according to claim 8, wherein said controller is connected to a transmission controller, said transmission controller outputting a virtual channel according to said number of a virtual channel supplied from said controller.

14. A queue control method including a first queue composed of a plurality of elements, each of said elements having an address specifying the next element, and a second queue composed of a plurality of elements, each of said elements having an address specifying the next element, the queue control method comprising the steps of:

setting a head address specifying the head element in said second queue in the tail element in said first queue;

setting a tail address specifying the tail element in said first queue in the tail element in said second queue;

processing said first and second queues on the basis of first pointer information made up of the head address in said first queue and second pointer information made up of the tail address in said second queue.

15. The queue control method according to claim 14, further comprising the step of, when said first queue is absent, setting not only an address specifying the head address in said second queue as said first pointer information but also first information indicating that said first queue is absent in the tail element in said second queue.

16. The queue control method according to claim 14, further comprising the step of, when said second queue

is absent, setting not only an address specifying the tail address in said first queue as said second pointer information but also second information indicating that said second queue is absent in the tail element in said first queue.

17. The queue control method according to claim 14, wherein the priority of said first queue is set higher than that of said second queue.

18. The queue control method according to claim 14, wherein said elements in said first and second queues are allocated the numbers of virtual channels in a one-to-one correspondence.